



Unilateral presentation of three muscles variants in the pectoral region.

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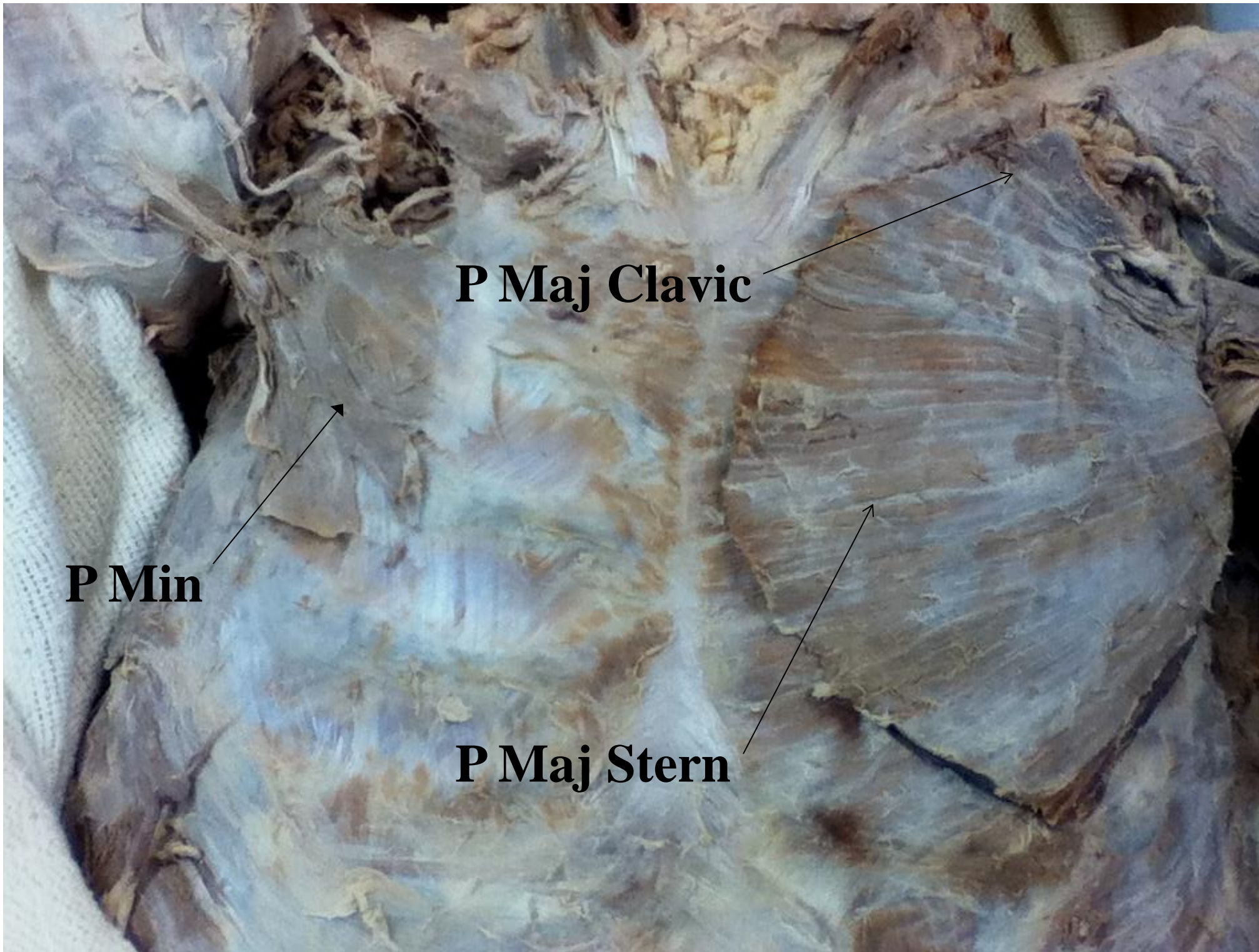
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Introduction

The goal of anatomical dissection for health science professions is to instruct students on “normal” or “expected” anatomy and apply that knowledge to the understanding of the disease process. However, it is not uncommon to observe anatomical structures that deviate from their “normal” form. These anatomical variants create a burden to clinicians when they are encountered during surgery or appear as soft tissue masses in radiologic images. Compounding the problem is the fact that these anomalies are rarely discussed in clinical anatomy courses or described in anatomy textbooks creating a gap of knowledge for clinicians increasing the likelihood iatrogenic injury. When variants are encountered during the course of clinical training we believe it is important to add them to the anatomical record.

Background

The pectoralis major and minor are the two primary muscles of the pectoral region. This figure depicts how these muscles would typically present in most people. On the right the pectoralis major muscle has been cut but left in place showing where it would normally attach on the clavicle and sternum. On the left the pectoralis major muscle has been cut and reflected to reveal the pectoralis minor muscle attaching to ribs 3, 4 and 5.



P Maj Clavic - Clavicular head of pectoralis major, **P Maj Stern** - sternal head of pectorals major, **P min**- pectoralis minor

Prevalence of Pectoral Region Variants

Muscle Variant	Prevalence in Population
Sternalis	3-8%
Pectoralis quartus	11-16%
Deficient pectoralis major	9%
Absence of pectoralis major	0.01%

Case Study

In this case report, we observed a situation in which three variant muscles presented unilaterally in a single cadaver. We observed that the pectoralis major muscle had a deficient sternocostal head. Also present were two muscles rarely observed in humans, a sternalis muscle, and a pectoralis quartus muscle. The existence of these muscle variants occurring individually in humans has been described in the literature for over a century. However, this is the first report of all three variants occurring simultaneously in one individual.



Discussion

In this case, we report the unilateral absence of the sternocostal head of the pectoralis major muscle that coincided with a sternalis muscle and a pectoralis quartus muscle. The documentation of anatomic variants is not only important for the anatomic record but for clinical training. The discovery of these “unusual” masses during the physical exam or as part of the findings in diagnostic imaging (e.g. CT or MRI scans) may lead to the interpretation of these benign tissues as malignant masses. Furthermore, it is important for plastic surgeons to be familiar with these anomalies as their presence has implications in breast reconstructive surgery, axillary lymphadenectomy, and other thoracic procedures.

This case has been submitted to the European Journal of Anatomy.